ATRIPLEX PERSISTENS (CHENOPODIACEAE), A NEW SPECIES FROM CALIFORNIA

HOWARD C. STUTZ
Department of Botany and Range Science,
Brigham Young University, Provo, UT 84602

GE-LIN CHU
Institute of Botany, Northwest Normal University,
Lanzhou, Gansu, China 730070

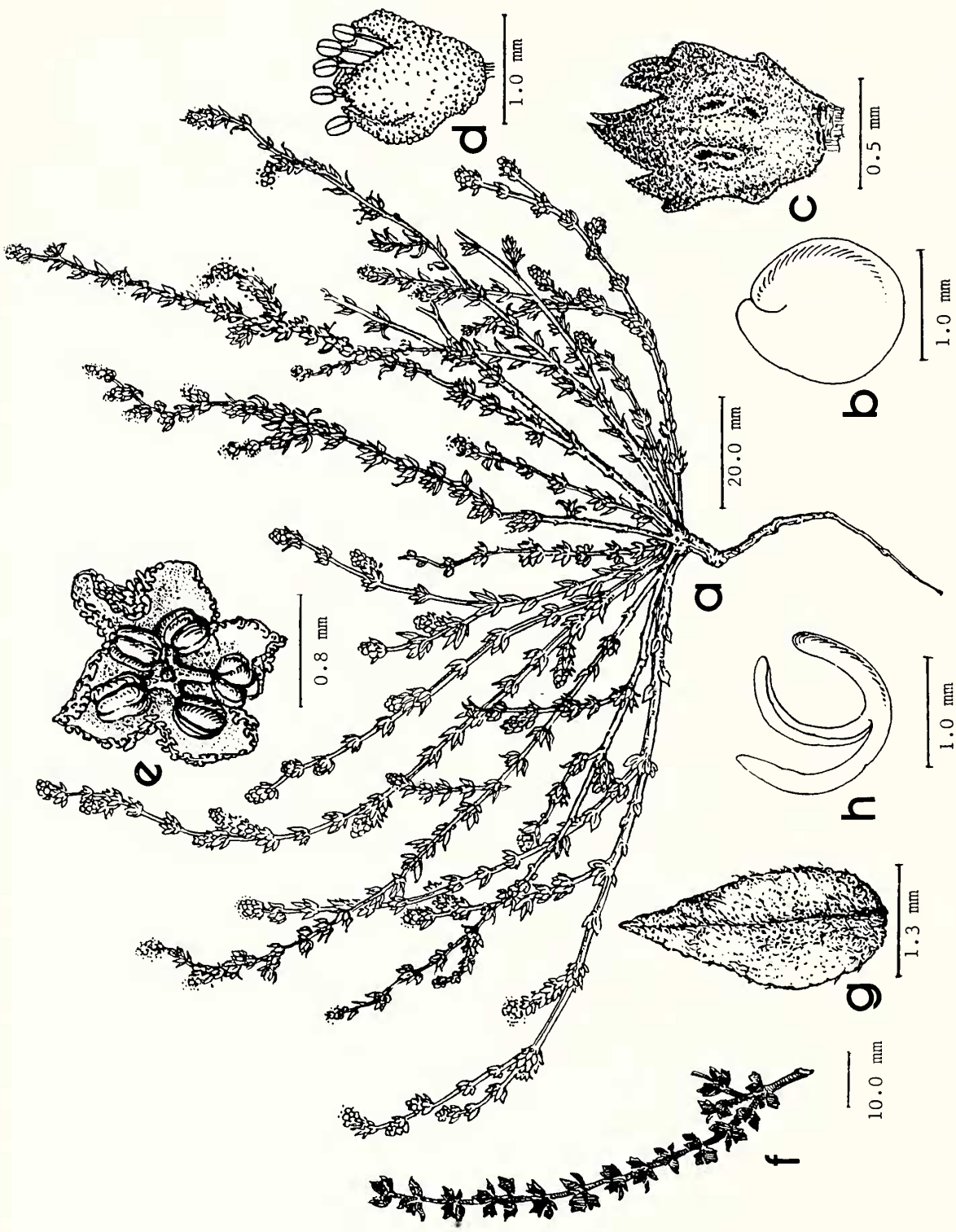
ABSTRACT

Atriplex persistens, a new annual species from California is described and illustrated. The new species appears to be restricted to vernal pond areas that dry during the summer months. Although collected earlier in Merced, Stanislaus, and Tulare counties, California, it is apparently now restricted to two small populations in the Sacramento Wildlife Refuge south of Willows, Glenn County, California. It appears to be most closely related to the perennial species *Atriplex fruticulosa.*

A distinctive new annual species of *Atriplex* was discovered by the first author in August 1989 in a moist depression approximately 0.5 km southwest of the Sacramento Wildlife Refuge Headquarters, 8 km south of Willows, Glenn Co., California. One other population was later found about 1.5 km northeast of the Sacramento Wildlife Refuge Headquarters. Several searches elsewhere on the Refuge and in surrounding areas did not reveal any other populations. In addition, a study was made of all types and collections of North American annual *Atriplex* in several herbaria, including CAS, DAV, GH, NY, RM, RSA, UC and US. Only three earlier collections of this new species were found and are noted below. Each of these earlier collections was labelled *A. parishii* Watson. Although *A. persistens* plants resemble plants of *A. parishii* in some characteristics, they differ significantly in habit, flowers and fruits. *A. persistens* plants are larger and coarser than *A. parishii* plants and, unlike *A. parishii,* the fruits of *A. persistens* are strongly indurate, dentate on the upper margins, widest above the middle, and are firmly attached to the branches. In *A. parishii* male and female flowers are borne together in axillary glomerules; in *A. persistens* male flowers occur separately in upper leaf axils and in terminal inflorescences.

In repeated searches by the current authors in the areas of the earlier collections, no *A. persistens* plants were found. The required habitat for these species appears to have been destroyed in these areas and may now exist in very few places other than the two sites described above in the Sacramento Wildlife Refuge, suggesting that the species is in need of immediate protection.

MADROÑO, Vol. 40, No. 4, pp. 209–213, 1993


a
20.0 mm
b
1.0 mm
c
0.5 mm
d
1.0 mm
e
0.8 mm
f
10.0 mm
g
1.3 mm
h
1.0 mm

Species Treatment

Atriplex persistens Stutz & Chu, sp. nov. (Fig. 1)—Type: USA, California, Glenn Co., 5 miles S of Willows, ¼ mi SW of Sacramento Wildlife Refuge Headquarters, T18N R3W S9, in a moist depression, 28 Sep 1990, *H. C. Stutz 95413* (holotype, BRY).

Herbae annuae, 10–20 cm altae; caulis erectus vel ascendens, ramis constipatis gracilibus expansis et dense furfuracee farinosis. Folia alterna, ovato usque ovato-lanceata, 2–4 mm longa, 1–3 mm lata, cinereo-virides, apice breviter acuminata, basi cuneata usque fere cordata, integra, sessilia, utrinque dense furfuracee farinosa. Flores monoecii. Staminales flores glomerati ad ramorum apicem axillares, in terminales spicas 0.5–4 cm longos, perianthium fere globosum, 1.5 mm in diam., 5-partitum ad basim, segmentis membranaceis, deltato-ovatis, postice prope apices viridi textura, stamina 5, filamentis filiformibus, antheris circa 0.5 mm longis, pleraque purpurato-rubris. Pistillati flores pleraque solitarii in foliorum oxillis sub staminalis inflorescentiis, bracteolis connatis ad super medio, stigmatibus 2–2.5 mm longis et stylo inconspicuo, fructiferi bracteae ovato-oblongae, leviter compressae, indurescentes ad midium et inferam partem, persistentes, 3–4 mm longae, 2–2.5 mm latae, dense furfuracee farinosae, utrinque 1–2 appendicibus inregularibus tuberculariibus. Utriculus lati-ovatus, semen 1.2–1.5 mm in diam., testa membranacea, brunneola, radicula supera.

Annual herbs, 10–20 cm tall. Stems erect or ascending, with crowded, slender, spreading branches and dense, scurfy covering. Leaves alternate, ovate to ovate-lanceolate, 2–4 mm long, 1–3 mm wide, grey-green, short acuminate at apex, cuneate to nearly cordate at base, entire, sessile, densely scurfy on both surfaces, kranz-type venation. Flowers monoecious; staminate glomerules axillary near the tip of branches and in terminal spikes 0.5–4 cm long, perianth nearly globose, ca. 1.5 mm in diameter, 5-parted to middle, segments membranaceous, deltoid-ovate, usually with green tissue on back near apex, stamens 5, with filiform filaments, anthers ca. 0.5 mm long, usually purple-reddish; pistillate flowers usually solitary in axils of leaves below the staminate inflorescence, bracteoles fused to above the middle, stigmas 2–2.5 mm long, style inconspicuous. Fruits broad-ovate, persistent on branches; fruiting bracts sessile, ovate-oblong, slightly compressed, hardened at the middle and below, 3–4 mm

←

Fig. 1. *Atriplex persistens*. a, habit. b, seed. c, fruiting bracts. d, male flower. e, male flower opened to show the stamens. f, dead branch with persistent fruits. g, leaf. h, embryo (drawing by Xia Quan).

long, 2–2.5 mm wide, covered with dense scurf, with 1–2 irregular tuberculate appendages on each surface. Seed 1.2–1.5 mm in diam.; testa membranaceous, red-brown; radicle superior; endosperm copious, irregularly excessive, causing the embryo to sporadically bulge. Flowering period: July–September. Chromosome number, $2n=18$.

PARATYPES: USA, CA: Glenn Co., Sacramento Wildlife Refuge, 5 mi S of Willows, T18N R3W S9, 25 Aug 1989, *H. C. Stutz 95126* (BRY); Sacramento Wildlife Refuge, 5 mi S of Willows, ¼ mi SW of headquarters, *H. C. Stutz 95230* (BRY); Sacramento Wildlife Refuge, 5 mi S of Willows, 1 mi NE of headquarters, T118N R3W S10, 9 Jan 1990, *H. C. Stutz 95231* (BRY); Sacramento Wildlife Refuge, 5 mi S of Willows, 20 May 1990, *S. C. Sanderson* and *G. L. Chu 95290* (BRY); Sacramento Wildlife Refuge, 5 mi S of Willows, ¼ mi SW of headquarters, 16 Aug 1990, *H. C. Stutz 95337* (BRY). Merced Co., Merced Plain, 3 mi SW of Merced, 18 Jun 1926, *J. T. Howell 2036* (CAS). Tulare Co., vernal poolbeds, 0.25 mi N of Avenue 104 on road 124, 280 ft elevation, 3 Aug 1963, *E. C. Twisselmann 8821* (CAS). Stanislaus Co., Carpenter road near San Joaquin River, S of Modesto, 27 Aug 1965, *R. F. Hoover 9519* (CAS, RM).

The closest relative of *A. persistens* appears to be the perennial species *A. fruticulosa* Jepson. Both species have sessile leaves, dentate-margined fruiting bracts and male flowers borne in terminal inflorescences. However, *A. persistens* is clearly distinguished from *A. fruticulosa* not only in being annual instead of perennial but also in having distinctively different fruits. The fruits of *A. persistens* are oblong-ovate, widest above the middle whereas those of *A. fruticulosa* are broadly rhomboid-ovate, widest at the middle. Also the fruits of *A. persistens* are so firmly attached that they persist even on old dead plants.

In the early spring of 1991 and 1993 the basins in which the two known populations of *A. persistens* were found were submerged with 6–12 inches of water. It is not known if this is a regular annual experience nor if it is significant in the survival of *A. persistens.* However, if it is requisite for its success it may help explain its apparent disappearance elsewhere in California. Agricultural practices and the management practices in the wildlife preserves of California would rarely perpetuate such a habitat. If we learn that such a habitat is required by *A. persistens,* hopefully, some of the wildlife preserves could be encouraged to provide areas where it could thrive. Because of the increasing disturbance of critical habitats required for other annual species of *Atriplex* in California it is imperative that their needs be met before they are extinguished. There appears to be some immediate urgency in arranging for adequate habitat for other annual *Atriplex* species in California, including: *A. coulteri* (Moq.) D. Dietr, *A. davidsonii* Standley, *Atriplex joaquiniana* A.

Nelson (*A. spicata* S. Wats.), *A. miniscula* Standley, *A. parishii* S. Wats., *A. tularensis* Coville (it may already be extirpated, e.g., Freas and Murphy 1988), and *A. vallicola* Hoover.

Literature Cited

Freas, K. E. and D. D. Murphy. 1988. Taxonomy and the conservation of the critically endangered Bakersfield saltbush, *Atriplex tularensis.* Biological Conservation 46:317–324.

(Received 1 Apr 1993; accepted 22 June 1993.)

ANNOUNCEMENT

VI Latin American Botanical Congress, Mar del Plata, Argentina, 2–8 October 1994

The VIth Latin American Botanical Congress (VI Congreso Latinoamericano de Botánica) will be held 2–8 October 1994 in Mar del Plata, Argentina. Mar del Plata is located 410 km south of Buenos Aires, on the Atlantic coast of Argentina.

The Congress is sponsored by the Sociedad Argentina de Botánica (SAB) and the Asociación Latinoamericana de Botánica (ALB).

The scientific program will include symposia, poster presentations, "all congress" lectures, and satellite meetings. The official languages of the Congress will be Spanish and Portuguese. Simultaneous English-Spanish translation will be provided, as needed. Papers intended for publication in the Congress proceedings can be submitted in Spanish, Portuguese or English.

The first circular, which includes a preliminary registration form, is now available. For further information, or in order for your name to be added to the mailing list, please contact: Dr. Arturo Martínez, Presidente, Comité Organizador, or Ing. Agr. Renée H. Fortunato, Secretaria Ejecutiva, VI Congreso Latinoamericano de Botánica, Instituto de Recursos Biológicos, INTA, Castelar 1712, Provincia de Buenos Aires, Argentina. (FAX: 54-1-481-2360.)